

ABSTRACT OF THE DISCLOSURE

A channel waveguide switch, driven by liquid crystal thermo-optic elements, suitable for use in integrated optic applications. Two trenches, one on either side and parallel with the core region of a channel waveguide Y-branch, are filled with a liquid crystal material possessing positive birefringence. When a given trench is held at a temperature a few degrees below the clearing point, the liquid crystal is in its nematic phase with its director aligned along the long direction of the trench so that both polarizations of the guided mode are loaded by the liquid crystal's ordinary refractive index. When the trench is held at a temperature a few degrees above the clearing point, both polarizations of the optical mode are loaded by the liquid crystal's isotropic index. By holding the temperature of the second trench at the alternate temperature, the differential loading on the Y-branch causes the guided mode to be switched into the path loaded by the liquid crystal's isotropic index. By controlling the liquid crystal temperature(s) at more than one location along the trench(s), the switch can be configured to operate as a variable attenuator.